

Hypertension Knowledge, Attitudes, and Behavior: 1985 NHIS Findings

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Synopsis

Data from the Health Promotion/Disease Prevention Supplement to the 1985 National Health Interview Survey provide an indication of progress made toward achieving the 1990 objectives for the nation. Survey results showed remarkably high levels of knowledge concerning the increased risks associated with uncontrolled high blood pressure.

Nine of 10 adults in the United States knew that high blood pressure increases the risk of heart disease, and 3 of 4 knew that high blood pressure is the most significant risk factor for stroke. The majority of both the general public and the subgroup of the population identified as hypertensives reported knowing the results of their last blood pressure measurement; and, most importantly, almost two-thirds of the identified hypertensives reported that their pressures were under control at last measurement.

Data examining professional advice, given and acted upon to achieve blood pressure goals, show that almost two-thirds of the hypertensives currently report taking antihypertensive medication. Results also suggest a degree of willingness by both professionals and hypertensives to attempt nondrug approaches to controlling pressures. The large majority of hypertensives who were advised by a health professional to cut down on sodium, lose weight, and exercise reported they were following this advice.

These findings will be used to further refine high blood pressure education strategies and advance the progress toward meeting the 1990 hypertension objectives.

PUBLIC KNOWLEDGE CONCERNING THE DANGERS of uncontrolled hypertension has surpassed the level set in a 1990 objective for the nation established by the Department of Health and Human Services (HHS)—that at least 50 percent of adults be able to state the principal risk factors for coronary heart disease and stroke (1). Results of the 1985 National Health Interview Survey (NHIS) show that 9 out of 10 adults know that high blood pressure increases the risk of heart disease, and 3 out of 4 identify high blood pressure as the most significant risk factor for stroke.

Achievement of this important objective 5 years in advance of the 1990 goal did not happen by chance. In 1972 the National Heart, Lung, and Blood Institute launched an intensive national public education campaign to combat the dangers of hypertension. This program, the National High Blood Pressure Education Program (NHBPEP), is

directed to furthering the public's knowledge of the nature of hypertension and the seriousness of its threat to health if uncontrolled. The NHBPEP is further challenged with the difficult task of affecting behavior changes among hypertensives to achieve and maintain blood pressure goals.

Data from the 1985 Health Interview Survey were analyzed to provide new indicators of how well these challenges are being met. This report focuses on the analysis of three areas of interest from the NHIS:

- progress toward the HHS objectives for the nation concerning public knowledge of high blood pressure,
- data to monitor trends in public perception of hypertension and its perceived importance to cardiovascular health, and
- detailed information to identify persons with

'Results of the 1985 National Health Interview Survey show that 9 out of 10 adults know that high blood pressure increases the risk of heart disease, and 3 out of 4 identify high blood pressure as the most significant risk factor for stroke.'

Table 1. Percent distribution of detected hypertension and prescribed medications in the total sample and in hypertensive group

Categories	Ever been told ¹	Told twice or prescribed medication ²	Told twice	Ever prescribed medication	On medication now
Total sample...	24	22	18	18	14
Hypertensive group:					
Ever been told ¹	100	86	73	73	55
Told twice or prescribed medication ²	100	100	85	86	65

¹Percentage responding yes to the question, "Have you ever been told by a doctor or other health professional that you had hypertension, sometimes called high blood pressure?"

²Percentage responding yes to any 1 of the following 3 questions: (a) "Were you told 2 or more different times that you have hypertension or high blood pressure?", (b) "Are you now taking any medicine prescribed by a doctor for your hypertension or high blood pressure?", (c) "Was any medicine ever prescribed by a doctor for your hypertension or high blood pressure?"

SOURCE: 1985 National Health Interview Survey.

hypertension more precisely and to measure levels of behavioral change made by this population to control blood pressure.

Data on professional advice and individual response to a wide range of therapeutic approaches—including antihypertensive medication, dietary sodium restriction, weight loss diets, and exercise—are of special interest to measure compliance with current recommendations for hypertension control. Specifically, answers to the following questions will help the NHBPEP identify and formulate strategies to continue to meet the overall goal of reducing cardiovascular morbidity and premature mortality in the nation:

- How much does the public know about the likely causes of heart disease and stroke?
- How much does the public know about risk factors for developing hypertension and the seriousness of its consequences?

Table 2. Demographic characteristics of the total sample and hypertensive group (percent)

Demographic characteristics	Total sample	Hypertensive group ¹
Sex		
Male	47	43
Female	53	57
Age		
18-29 years	28	7
30-44 years	30	18
45-54 years	13	18
55-64 years	13	23
65 years and older	16	35
Race		
Black	11	14
White	87	85
Other	2	1
Annual income		
Under \$10,000	17	25
\$10,000-\$19,999	22	23
\$20,000 and up	57	41
Unknown	4	11
Education		
Less than 12 years	24	37
12 years	39	35
More than 12 years	37	28

¹Respondents reporting that they were told at least twice they had hypertension or had been prescribed medication.

SOURCE: 1985 National Health Interview Survey.

- Are there differences in the knowledge, attitudes, and behavior of identified hypertensive patients in comparison with those of the general public?
- Among hypertensives, what approaches to treatment have been prescribed, followed, and maintained?

Analytic Dimensions

Data from the 1985 National Health Interview Survey that measure the general public's perception of high blood pressure are valuable in evaluating the effectiveness of the NHBPEP. However, hypertensive patients are the most important target audience for the majority of current high blood pressure education activities. Therefore, information on the knowledge level and behavior of the hypertensive population is of special interest. To this end, data from the 1985 survey were first analyzed by several variables to categorize respondents as either hypertensive or normotensive. Historically, analyses of interview surveys that do not include actual blood pressure measurements identified respondents who said they had been told by a health professional that they had high blood pressure as hypertensive persons. The analysis of

Table 3. Percent responding that each of these 10 factors either definitely or probably increases a person's chances of getting heart disease

Factors increasing the chance	Total sample	Hypertensive group
Overweight	93	92
High blood pressure	91	92
Cigarette smoking	90	88
High cholesterol	86	86
Worry or anxiety	84	86
Family history of heart disease	82	81
Diet high in animal fat	80	82
Overwork	71	68
Diabetes	60	59
Coffee with caffeine	51	52

SOURCE: 1985 National Health Interview Survey.

this survey identifies this category of hypertensives in the same manner (table 1).

However, in the 1985 National Health Interview Survey, additional questions were asked that allowed more precise identification of hypertensives. "The 1984 Report of the Joint National Committee on Detection, Evaluation, and Treatment of High Blood Pressure" recommended that a diagnosis of hypertension be made only after repeated elevated blood pressure readings on two or more occasions (2). Therefore, response to the 1985 NHIS question, "Have you been told two or more different times that you had hypertension?" helped to differentiate persons more likely to be diagnosed hypertensives from those who may have experienced an elevated reading on only one occasion. Respondents who said they had been told more than once that they had hypertension or who reported they had ever been prescribed medication for high blood pressure were identified as the hypertensive population in this analysis. Nonetheless, it is recognized that these are reported hypertensives not verified by blood pressure measurements.

Analyses of data from the 1971-74 and 1976-80 National Health and Nutrition Examination Surveys (NHANES I and II), where blood pressures were measured, estimated the prevalence of hypertension (defined as blood pressure \geq 160/95 mm Hg or taking antihypertensive medication) in adult Americans to be in the range of 18-22 percent (3). Our analysis of the 1985 NHIS data yielded a 22 percent prevalence rate for hypertension, similar to the NHANES I and II studies.

Table 2 compares the demographic characteristics of the reported hypertensive subgroup with the total survey population. As expected, the

Table 4. Responses to "Which of these factors most increases a person's chances of having a stroke?" (percent)

Demographic characteristics	High blood pressure	Cholesterol	Diabetes	Other
Total sample	77	12	4	7
<i>Race</i>				
Black	79	8	5	8
White	77	12	4	7
Other	60	17	4	20
<i>Sex</i>				
Male	75	13	4	7
Female	79	10	4	7
<i>Age</i>				
18-29 years	73	15	6	6
30-44 years	80	11	4	6
45-54 years	81	10	3	6
55-64 years	79	11	3	7
65 years and older	74	10	4	12
<i>Education</i>				
Less than 12 years	72	10	5	12
12 years	79	11	4	6
More than 12 years	78	13	4	5
<i>Hypertensive group.</i>				
<i>Race</i>				
Black	82	7	4	7
White	82	10	3	6
Other	72	14	3	10
<i>Sex</i>				
Male	81	10	3	5
Female	82	9	3	6
<i>Age</i>				
18-29 years	78	11	8	3
30-44 years	86	8	3	4
45-54 years	85	9	3	3
55-64 years	82	10	2	5
65 years and older	78	10	3	9
<i>Education</i>				
Less than 12 years	79	9	3	9
12 years	82	10	3	4
More than 12 years	84	9	3	4

SOURCE: 1985 National Health Interview Survey.

hypertensive population is older and includes a higher percentage of blacks, females, and persons in the lower socioeconomic strata.

Findings

The overwhelming majority of Americans know what to avoid to decrease their chances of heart disease. Table 3 shows that more than three-fourths of the public recognized the risk factors known to be associated with coronary heart disease, and in addition identified overweight, which is a risk factor for hypertension. The general public clearly recognizes high blood pressure, smoking, and elevated cholesterol levels as major risk factors for coronary heart disease. Hypertensives as a group also showed these remarkably high levels of knowledge regarding risk factors

'According to the NHIS findings, almost everyone in the nation knew whether their last blood pressure measurement was high, low, or normal, and most people were told their most recent blood pressure measurement in numbers. The educational message "know your numbers" has been understood, and this 1990 hypertension objective has been met.'

Table 5. Responses to "Which of the following substances in food is most often associated with high blood pressure?" (percent)

Demographic characteristics	Sodium	Cholesterol	Sugar	Don't know or other
Total sample.....	58	25	8	8
Race				
Black	48	25	16	11
White	60	24	8	8
Other	44	26	11	19
Sex				
Male	56	25	10	9
Female.....	60	24	7	8
Age				
18-29 years	54	28	11	7
30-44 years	63	23	7	6
45-54 years	62	23	7	7
55-64 years	60	24	7	8
65 years and older	50	23	11	15
Education				
Less than 12 years	43	25	16	16
12 years.....	57	27	8	8
More than 12 years....	69	22	4	5
Hypertensive group.				
Race				
Black	54	24	13	9
White	67	20	6	7
Other	68	14	6	12
Sex				
Male	66	21	6	7
Female.....	64	21	7	8
Age				
18-29 years	64	24	8	4
30-44 years	73	18	4	4
45-54 years	72	18	4	4
55-64 years	65	23	5	6
65 years and older	58	21	10	11
Education				
Less than 12 years	52	23	13	12
12 years.....	69	22	4	5
More than 12 years....	78	17	2	3

SOURCE: 1985 National Health Interview Survey.

Table 6. Responses to "At your last measurement, were you told what your blood pressure was in numbers?" (percent)

Demographic characteristics	Yes	No	Don't know
Total sample.....	61	30	9
Race			
Black	50	39	11
White	63	28	9
Other	48	37	15
Sex			
Male	62	28	10
Female.....	60	31	9
Age			
18-29 years	57	33	10
30-44 years	63	28	9
45-54 years	64	28	8
55-64 years	63	28	9
65 years and older	59	30	10
Education			
Less than 12 years	46	42	12
12 years.....	60	31	9
More than 12 years.....	72	21	8
Hypertensive group....			
Race			
Black	54	34	11
White	74	19	7
Other	65	24	11
Sex			
Male	74	18	8
Female.....	68	24	8
Age			
18-29 years	70	22	7
30-44 years	75	18	7
45-54 years	72	20	7
55-64 years	71	21	8
65 years and older	67	23	9
Education			
Less than 12 years	57	31	12
12 years.....	75	19	5
More than 12 years.....	83	10	6

SOURCE: 1985 National Health Interview Survey.

associated with coronary heart disease. These results suggest that extensive risk factor education efforts have reached the public as well as persons with hypertension.

The fact that high blood pressure is the major risk factor for stroke was recognized by 77 percent of the public and by 82 percent of reported hypertensives (table 4). These findings are especially noteworthy since respondents were limited to identifying only one risk factor rather than responding positively to multiple suggestions as in table 3. Females tended to identify high blood pressure as a cause of stroke somewhat more often than males, and this knowledge was more common in persons between 30 and 65 years of age. The knowledge that hypertension increased the chances of having a stroke also tended to increase with education level.

Table 7. Responses to "At your last measurement, was your blood pressure high, low, or normal?" (percent)

Demographic characteristics	Base			
	High	Low	Normal	Don't know or other
Total sample.....	7	6	80	6
Race				
Black.....	10	3	81	6
White.....	7	7	79	6
Other.....	4	7	83	6
Sex				
Male.....	7	4	82	6
Female.....	8	9	77	6
Age				
18-29 years.....	11	6	85	5
30-44 years.....	6	8	81	5
45-54 years.....	10	7	76	6
55-64 years.....	12	5	76	8
65 years and older.....	10	5	76	9
Education				
Less than 12 years.....	11	5	75	8
12 years.....	7	6	81	6
More than 12 years.....	6	8	82	4
Hypertensive group...				
Black.....	26	2	62	9
White.....	31	2	59	8
Other.....	26	2	63	9
Other.....	25	1	66	8
Sex				
Male.....	25	2	65	8
Female.....	27	2	60	10
Age				
18-29 years.....	37	2	54	7
30-44 years.....	33	2	58	7
45-54 years.....	29	2	61	8
55-64 years.....	27	2	61	10
65 years and older.....	19	2	68	11
Education				
Less than 12 years.....	27	2	60	11
12 years.....	27	2	62	9
More than 12 years.....	24	2	66	7

SOURCE: 1985 National Health Interview Survey.

More than half the respondents knew of the association between sodium and high blood pressure, and this observation was somewhat more frequent among persons with hypertension than in the general public (table 5). Consistently lower responses correctly associating sodium with high blood pressure, and higher responses incorrectly associating sugar with high blood pressure, were seen in blacks and in those not finishing high school, suggesting a need for targeting specific messages to lower socioeconomic audiences.

One of the nine 1990 objectives for the nation for hypertension is that at least 90 percent of adults will be able to state whether their current blood pressure is normal or elevated, based on their most recent measurement (1). Seventy-one percent of the hypertensive group and 61 percent of the general public reported being told their

Table 8. Responses to questions regarding medication-taking behavior (percent)

Demographic characteristics	Base		
	Now taking medication ¹	Medication prescribed but not now taking ²	Not now taking medication—advised by doctor to stop ³
Hypertensive group.....	65	59	61
Race			
Black.....	63	66	47
White.....	65	58	64
Other.....	58	49	63
Sex			
Male.....	60	56	61
Female.....	68	62	62
Age			
18-29 years.....	11	35	53
30-44 years.....	42	50	64
45-54 years.....	65	64	62
55-64 years.....	73	71	54
65 years and older.....	81	81	68
Education			
Less than 12 years..	70	67	56
12 years.....	63	59	60
More than 12 years..	60	51	70

¹Question: "Are you now taking any medicine prescribed by a doctor for your hypertension or high blood pressure?" Base: total hypertensive sample.

²Question: "Was any medicine ever prescribed by a doctor for your hypertension or high blood pressure?" Base: respondents who reported not currently taking medication.

³Question: "Did a doctor advise you to stop taking medication?" Base: respondents who reported not currently taking medication but who had been prescribed medication.

SOURCE: 1985 National Health Interview Survey.

blood pressure levels in numbers (table 6). Among the hypertensive group, nearly three-fourths of the white population were told their pressures in numbers; only slightly more than half of blacks were told at their last visit. Regardless of hypertension status, persons with more education were more likely to be told their blood pressure levels at their last visit. In addition, table 7 indicates that 94 percent of the public could identify their last reading as being normal, high, or low. Therefore, another 1990 hypertension objective has easily been met. Although these are encouraging statistics, it should be noted that information on the actual blood pressure levels used by the respondents to identify high, low, and normal pressures was not available.

Although there are limitations of self-reported data, table 7 shows that 64 percent of the hypertensive group stated that their blood pressures were under control at last measurement (62 percent normal, 2 percent low). At the last measurement, elevated readings were more frequently reported by blacks, regardless of hypertension status, than by whites. Among the

Table 9. Nonpharmacologic approaches prescribed, attempted, and currently

Demographic characteristic	Question: "Because of your high blood pressure, has a doctor or other health professional ever advised you to ¹ —			Question: "Have you ever followed the advice of a doctor or other health professional to ² —		
	Cut down on salt/sodium in your diet?	Diet to lose weight?	Exercise?	Cut down on salt/sodium in your diet?	Diet to lose weight?	Exercise?
Hypertensive group.....	75	48	42	95	89	86
<i>Race</i>						
Black	82	50	39	95	90	87
White	73	47	42	95	89	86
Other	72	52	37	98	86	82
<i>Sex</i>						
Male	74	48	42	94	88	86
Female.....	75	47	41	95	90	86
<i>Age</i>						
18-29 years	71	32	36	89	88	86
30-44 years	74	52	45	92	89	86
45-54 years	79	58	47	95	90	87
55-64 years	75	53	45	97	89	86
65 years and older	73	40	36	95	88	85
<i>Education</i>						
Less than 12 years	76	45	36	94	87	82
12 years.....	74	48	43	94	90	86
More than 12 years.....	73	49	48	96	91	89

¹Base: Total hypertensive sample.

²Base: Respondents who reported they had been advised by a doctor or other health professional to cut down on salt/sodium in their diet, diet to lose weight, or exercise.

hypertensive group, the frequency of normal pressures increased with age, confirming previous findings that rates of hypertension control tend to be higher in older populations (4).

Results from large clinical trials have shown that antihypertensive medication effectively lowers blood pressure and, in turn, reduces cardiovascular morbidity (5-7). Almost two-thirds of the hypertensive population reported currently taking medication for their blood pressure (table 8). Current use of medications increased dramatically with age, decreased slightly with education level, and was reported more frequently by females than males.

Hypertensives who reported not currently taking medication were queried further, and 59 percent reported having had antihypertensive medication prescribed in the past (table 8). The hypertensives who reported not taking prescribed medications were most often blacks and persons with less education. In addition, there was a clear relationship between those who reported not taking prescribed medication and increasing age.

The hypertensives who had been prescribed medication but were not currently taking it were questioned further about their reason for stopping. Table 8 indicates that more than half of these hypertensives (61 percent) had been advised by

their doctors to discontinue taking medication. This response was less frequent among black hypertensives (47 percent) and increased with educational level.

In addition to examining medication-taking behavior, the National Health Interview Survey also examined the use of nondrug therapies to control hypertension. Table 9 examines the frequency of professional advice, attempts to implement the advice, and maintenance of the advised behavior for three nondrug approaches for the control of hypertension—sodium restriction, weight loss, and exercise. Of the three nondrug approaches, reducing salt intake was by far the most frequently reported professional advice received by hypertensives (75 percent), followed by dieting to lose weight (48 percent), and exercise (42 percent). Eighty-two percent of black hypertensives and 73 percent of white hypertensives were advised to cut down on sodium; however, no differences were reported between men and women for any of the nonpharmacologic approaches. Hypertensives between the ages of 45 and 54 were more likely to be given specific nonpharmacologic advice than their younger or older counterparts.

Almost all hypertensives advised to restrict sodium intake did try to cut down, and most advised

Question: "Are you now following the advice of a doctor or other health professional to³—

<i>Cut down on salt/sodium in your diet?</i>	<i>Diet to lose weight?</i>	<i>Exercise?</i>
91	74	77
92	74	78
91	74	77
90	75	86
92	73	82
91	74	74
80	72	82
89	72	82
90	76	78
94	77	77
94	70	78
92	70	74
90	75	77
93	77	81

³Respondents who reported they had followed the advice of a doctor or other health professional to cut down on salt/sodium in their diet, diet to lose weight, or exercise.

SOURCE: 1985 National Health Interview Survey.

to diet to lose weight or to exercise also attempted these behavioral approaches (table 9). Remarkably high frequencies (ranging from 82 to 98 percent) indicate a high degree of willingness by all demographic groups in the analysis to try these methods of controlling high blood pressure.

Maintaining behavioral change is known to be difficult. However, 91 percent of the hypertensive group who followed professional advice to reduce sodium intake were still restricting sodium in their diets at the time of the study.

Maintenance of exercise as a means to control blood pressure was also frequently reported—males with hypertension were more likely to be currently exercising than females with hypertension (82 percent compared with 74 percent). Further, table 9 indicates a trend for exercise advice and behavior to be more common in persons with higher levels of education. Analysis of additional NHIS data, reported in another paper in this series, confirms this relationship with specific exercise activities.

It was not surprising that dieting to lose weight appeared to be the most difficult behavioral approach to maintain. The finding that 74 percent of hypertensives who attempted weight-loss diets were still trying is encouraging.

Summary

The 1985 NHIS data suggest that the public is aware of the major risk factors for heart disease and stroke. Remarkably high levels of knowledge were observed in both the hypertensive group and the general public.

According to the NHIS findings, almost everyone in the nation knew whether their last blood pressure measurement was high, low, or normal, and most people were told their most recent blood pressure measurement in numbers. The educational message "know your numbers" has been understood, and this 1990 hypertension objective has been met.

In the area of utmost concern—behaviors to achieve and maintain blood pressure goals—results of the 1985 survey are also optimistic. Approximately two-thirds of the hypertensive population reported currently using antihypertensive medication. Of the persons with hypertension who had antihypertensive medication prescribed but were not currently taking it, almost two-thirds reported stopping on their doctor's advice. Previous public knowledge surveys have also identified a large proportion of persons with hypertension who reported they were no longer taking medications for their condition because their physicians had told them to stop (8). It may very well be that some of these patients had been or were attempting to control hypertension by nonpharmacologic methods and were being weaned from their medications. A large majority of the hypertensive group reported not only a willingness to cut their sodium, to diet to lose weight, or to exercise, but also that they were currently following these recommended nonpharmacologic therapies to control their blood pressure.

However, it should also be pointed out that patients may fail to understand their physicians' instructions and stop taking their medication when told their blood pressure is controlled, misinterpreting this control as being "cured." These issues need to be clarified in subsequent surveys of the public, of persons with hypertension, and of physicians.

The information from the National Health Interview Survey on public knowledge and patient behavior is highly encouraging. The NHBPEP will use these findings to refine further its message strategies and target audiences. In this way, progress toward all of the 1990 HHS hypertension objectives can be advanced.

NOTE: The design of the survey is described in detail in "The 1985 Health Promotion and Disease Prevention Survey" by Owen T. Thornberry, Ronald W. Wilson, and Patricia M. Golden, *Public Health Reports* 101: 566-570, November-December 1986.

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